MAR 90

ZX-Appeal

vancouver sinclair users group

next meeting:

KILLARNY COMMUNITY CENTRE
6260 KILLARNY STREET
VANCOUVER

FRIDAY; 7:00PM

March 9/90

ZXAppeal is a monthly newsletter put out by the Vancouver Sinclair Users Group. For more information on the group and ZXAppeal see the backcover.

inside

INSIDE:

-Harvey
-Jack
-Bill
-Vince
-Seward
-& Ken

THIS ISSUE.....

Hi. Nice to see ya. Have a good winter? Howdya like the snow? Hope you got some computin' time in while snowbound. Anyways, this month we got a whole mess a good stuff for ya so settle back and hold on: Vince L. is back with a further installment of his well regarded MC series; Harvey T.'s along with another of his highly informative "Playing withs"; Bill Jones of UPDATE Magazine wrote me a pretty good analysis of the Cambridge Z88 and has allowed me to share it with the rest of you; Jack Dohany has finished his upgrading of WORDMASTER to U.S. version 1.08 and his descriptive announcement is within (This is one of the best programs written to really put the 2068 through its paces and any serious TSer's library should include this program); Ken A. has contributed what we in the Editor's chair hope to see turn into a regular submission - a column of just plain interesting stuff; we complete the 2068 program from last month. Lastly we include the notice from the S.M.U.G. group about their SINCLAIR COMPUTER EXPOSITION to he held in Milwaukee, Wisconsin early June.

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January 10/90 Minutes

-by your humble scribe

Upon entering the second floor board room, we were greeted with the sight of a 2068 Larken DD and Ramdisk system and a KayProFour set up. At 19:20 the firebells started to ring, not an auspicious omen. At 19:30 there were 17 intrepid spirits ready to brave the rigours of computer orphanhood. It quickly transpired that the minutes of Nov/89 were in error. [See Dec/89 Page 4: Substitute Marie for Mario] (Your humble scribe is an omnivore; crow having been eaten, the meeting continued.)

Gerd told of receiving a PROM 8 eprom burner as a hand-me-down from his work. He passed around the instruction manual. If anyone needs to get some eproms blown, give Gerd a call.

Rusty Townsend was away in Las Vegas so there was no VP report.

Rod Humphreys, the Treasurer, was back from gallavanting about Mexico in November and Chicago in December. He had the Larken disk interface and LK-DOS eprom card for the club 2068 system. These items cost the club $152.26. They were duly presented to Harry Slot who is doing the greater part of the librarian duties at present.

We had a couple of visitors from Kelowna, John and Brendan Regan. John just got a QL and he was full of questions. He was seen later talking to Harvey. Louis Montminy also brought a friend, Fred, to carry the KP4.

Gerd also passed around a Casio portable computer, more like an overgrown calculator actually. This thing had a 2K battery-backed ram pack with a program which was dedicated to adjusting racing car camshafts.

Rod, the Editor, discussed the Post Office in fine and glowing terms. He is cutting it real close with the weight per letter allowance. He wants articles! Write!

Harry Slot of the Hardware SIG reports that he is dabbling once again; the house building being about done. He has been playing with an Eprom burner board, as well as a 32K battery backed memory board for the TS1000.

It was about this point that Gerd could hold back no longer the story of his debut as an electronics garbage picker. It seems some store nearby his workplace threw a bunch of `rare and priceless', i.e. not IBM compatible, electronics junk into a dumpster which our valiant leader espied. Needless to say, to be a Sinclairite is to be cheap and the junk did not remain long in the dumpster.

Gerd has the book library if you want something. Harry now has the TS2068 and the TS1000 software libraries, but I imagine it will take a while before he gets it all organized and a list published. Bill Rutter donated the remains of his setup, which he did not sell, to the club. For this generous act he received a round of applause and many good wishes.

The meeting dissolved into demos. Louis with the KP4 at one end and Rod with the Larken system at the other. Amazingly, we all seemed to know why we were there...

Feb 9/90 Minutes

-by your 'umble scribe

We appear to have entered the strange meeting zone - just down the hall from the twilight zone (across the hall from Clive). It was raining cats & dogs at meeting time on top of which some kids were having a dance upstairs at the community club so we were back downstairs in the old room. The backgroud noise level was high. At any rate, it was decreed by Rod H. fiat that this month the folks present were to be called *stalwart souls*. There were 14 at 19:35.

Glenn Read is squeamish about the Squamish highway (hold on, it gets worse) and was absent. Louis Montminy had a KP2 which he has accumulated. This month Guido Vieira had an Oborne and they were busy exchanging disks.

Gerd opened the meeting by informing us that he had acquired two full-height disk drives for the TS 1000 library system.

The Hardware SIG reports that contrary to previous reports, Harry Slot is still working on his house.

Rusty Townsend stood to tell us he had nothing to say, then proceeded to regale us with tales of his big win in Las Vegas. He also mentioned an upcoming computer show in Kent. This occasioned another discussion of the Great Canadian pastime of "bluff the border guard". Look for an article on the Kent show.

Rod H. as Treasurer says we have about $1k.

Rod H. as Editor had nothing to say except ***"send articlesll"***. Then Rod told us about innocently pointing out WordMaster to Jack Dohaney, and the resulting North American version which Jack has produced. Look for an article from Rod.

Gerd put on his most plaintive voice and pleaded for somebody to help H. Slot with the cataloguing of the software libraries. Vince Lee volunteered.

Marie Kendall innocently asked about cleaning dust out of computers and it kicked off a round of story telling. The consensus being that it was no problem for convection-cooled equipment, but that regular PCs and such with fans could use periodic vacuuming. For intermittent flakiness possibly due to dust, a shot of contact cleaner works wonders.

Ken Grant demonstrated his homemade paper guide and printer-holder tray. Harvey passed around a newspaper clipping on the new AT&T Light Processor. Harvey also read a couple of excerpts from the QJump2 newsletter. Look for some excerpts reprinted by Rod H. Ken Abramson

passed around a downloaded article on the book "Mind Children: The Future of Robot and Human Intelligence" by Hans Moravec of Carnegie-Mellon University. Guido Vieira passed around a book (the title of which I have forgotten) on mind and machines, mimicking brain function with logic circuits. He is into Neural Nets lately.

The band got really loud upstairs & we adjourned early to individual shouting.

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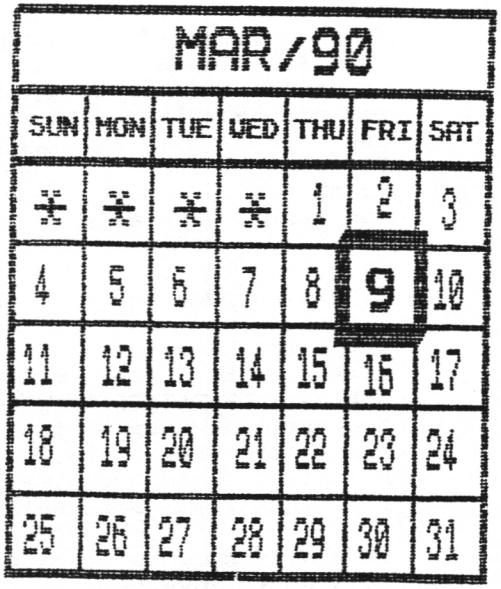
...meeting date



Jack Dohany
435 Woodward Way
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404-543-5309
January 1990

DESCRIPTION OF WORD-MASTER
(USA version 1.08)

Word-Master is a software package written for the Spectrum by Paul Sneesby and Barry Parkinson, of PCG Software in England. The package is sold and supported in the USA by Jack Dohany. The USA version is designed to run on the Timex/Sinclair 2068 computer, equipped with any form of Spectrum emulator. The software is provided in pre-customized form for any 2068 disk system and printer interface. The software can also be used with cassette. Ordering information is on the reverse.

Word-Master is a full-featured "extendable" word processor, written entirely in machine code, with provision for BASIC disk access. The program uses a Tasword-like 64-column display... but there the similarity with Tasword ends. I'd like to discuss three main features which distinguish the program: file handling, graphics capability and extension programs.

File handling is what makes the other two features possible. Word-Master has a sort of integral ram-disk, which permits you to load as many files as there's room in memory for... and there's over 28k of file space! The files may be text, graphics, fonts, extension programs, or "page layouts". You can easily switch from one to the other,and you can link text files. The package includes numerous ready-to-use files.

Graphics capability: you can load a screen and easily "capture" all or part of it, automatically converting it into a "graphic file" suitable for inclusion by name in a text file. When the text file is printed, the named graphic is accessed from memory and printed along with your text. Of course, the printer must have graphics capability. You control the position and size of the graphic with commands imbedded in the text. You can include many graphics in a text.

Extension programs are utilities which, when loaded and selected, add powerful capabilities to the "core" word processor. A bunch of small utilities are included in the package. There are two large utilities which are extra-cost options: HEADLINER (a graphics processor), and TYPELINER (a fantastic desktop publisher). Both include a number of special fonts. The TYPELINER fonts are complex proportional "printer oriented" letter-quality fonts. There are two additional TYPELINER font-packs which are extra-cost options.

It's difficult to describe how smoothly and elegantly all of this works together. Try it! You'll like it! And if you don't, you can get a refund.

ORDERING WORD-MASTER
To order (or pay for) WORD-MASTER, please fill out and return a copy of the attached registration form. When ordering, you need pay ONLY for WM itself ($18) and the $3 charge for shipping. You will receive the COMPLETE package with all options, customized for your equipment where possible.

After you receive the package and have a chance to evaluate the options, you can decide which of the options you wish to purchase. You can then fill out and send me a new registration form, omitting the EQUIPMENT section. You are expected to pay only for those options which you like and use. You need not return or erase unpurchased options. If you initially find you have no use for an option, and later find that you DO have a use for it, then you should pay for it at that time.

If you find you hate the whole thing, you can return the entire package and receive a refund of the amount paid.

WORD-MASTER PRICES
The price of the USA version of WORD-MASTER is about 20% below the British list price, converted to dollars. The price ranges from $18 to $67, depending on which options you choose to purchase.

DEDUCTIONS
If I owe you money, you may deduct the amount owed from what you pay for WM. Just make a note explaning the deduction on the back of the registration form.

NOTE: If you are already a legal owner of the British version, then you should pay only $5 for the USA version of WM itself, rather than $18. You should also pay for any options that were not purchased with your British version, assuming you wish to purchase them now.

LOW ON FUNDS?
The complete WORD-MASTER package is rather expensive. You need not pay for it all at once. You can pay for it as your budget permits.

SUPPORT
When you purchase software from me, you are entitled to one supportive phone-call or letter-reply at no charge. If you require further assistance I'll be happy to provide it, but I'll bill you for my time, at $5 per hour. However, correction of any errors on my part is always free.

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Two men were preparing to go hiking in Yosemite National Park. One asked the other why he was putting on a pair of running shoes instead of hiking boots. "In case we meet a bear," he replied. "That's silly, you can't outrun a bear." "I don't have to outrun the bear, I only have to outrun you."

UPDATE MAGAZINE
1317 Stratford Ave
Panama City, FL 32404
January 25, 1989

Mr. Rod Humphries
2006 Highview Place
Port Moody, BC, V3H 1N5
Canada

Dear Rod,

It was nice talking with you. Since you spent a chunk on the telephone call, the least that I can do is to reply in more detail about the Cambridge Z88. I will also inclose the October 89 issue of Update, which is the first issue of the 1990 year. The issue year is confusing to some. Year issues start in October because October 87 was the first issue. We have the Chinese New year, the Jewish New year, and why not the Update new year, eh?

I have had my Z88 about a year. With so much desk capability, and my limited travels, I have not found a lot of use for it. That statement speaks for the Z88's very limited usefulness for desk top use, mainly because of its tiny screen display and lack of I/O for disk operation. There is a disk drive for the Z88, but it cost $375.00 and is quite mideaval, more like a fast cassette that we are accustomed to using with the old Sinclair's. The DOS only handles single side read write and has a maximum storage of 120K per side. But, the DD is battery operated, which has portability assets. And, there is a battery operated "Dicontex" printer, also small to match the portable motif. These three units make up a package to fit into a small briefcase.

The two ROM BASED softwares, Pipe Dream and Diary, are both excellent. Pipe Dream is about the equilivant of the QL's Quill. Diary is a combination software that one can use as a "Record" type program or for many other purposes. Both softwares integrates well with the memory management of the Z88. Since both are "in ROM" they are just there all of the time. You could think of these two softwares as just part of the operating system. And, the data previously created with the two programs are retained until a decision is made to clear. The whole Z88 memory is non-volatile. But, depending upon the cartridge memory installed, the battery life varies from a few hours to days. Also, the length of usage of a printer or disk drive would affect battery life. Even so, the Z88 protects memory very effectively. It "goes to sleep" and holds memory non-volatile even when there is insufficient battery power to operate the computer. It will appear to be dead, but with battery replacement the data will be there.

The Z88 is very limited without extra memory. Only about two or three written pages of data can be stored with the built in ram. I believe this is about 8K of FREE, but it could be a few K off. I bought a 128K RAM cartridge and a 32K EPROM cartridge with the computer. I also have the two LINK sofwares, PC LINK and QL LINK. The Link software consists of an Eprom cart for the Z88 and a diskette for the Linked computer. DATA File transfer is easy between the Z88 and the Linked computer, which makes the QL a DISK or Microdrive "interface" for the Z88. "Create data on the road and then Store it to QL Disk upon return home". (Or to IBM Disk). I haven't done much of that, but my Son has with his IBM system. Data files can be input (after transfer) to the IBM Word Perfect, or to the QL's Quill.

I have used the Z88 and its parallel interface cable to print directly with my printers. The parallel interface is almost identical to that for the QL, a cable that hooks to the Z88, the opposite end having a small serial to parallel interface that hooks to the printer. I dont have a serial printer,

but would say that the Z88 would hook directly to one.

The only publication support for the Z88 is the magazine "EPROM", a half page size bi-monthly from England. I subscribe to that through Sharps. The content of EPROM is shallow and it does not do much for me. I read between the lines of EPROM that programming information is not available from Sinclair, even in England.

I would use the Z88 as a desk top constantly, interfaced by the LINK software to the QL, if the Z88's screen was satisfactory. But with the better display already available on the desk, that would equate to self punishment. Also, there is so much more software capability of the QL that such use would not be advantageous. This leads me into a comparison of the Z88 and other Portable systems.

As usual, Sinclair produced the Z88 at a time when comparable systems were very high in price. Two years ago I looked at portable MS-DOS computers and found them to cost a minimum of $3500. Now Toshiba has a 640K MS-DOS portable, with disk drive, and a much larger fold-up screen, all for about $700. It loads and operates most MS-DOS software. Some other MS-DOS portables, Toshiba included, have built in hard drives and cost around $1800. It would be easy to sink over a $1000 into a Z88 and be left with vastly inferior capability. So, the only reason that I can see for one to buy a Z88 seems to be "Sinclair loyalty". Of course, another reason could be a "rummage sale bargain". If one could pick up a Z88 that is equipped with a 128K Ram cart for less than $350-- well, why not? Thats only half what a 640K, disk equipped, MS-DOS Portable cost.

Today the term "Personal Computer" means anything from Psion's calculator size computer to IBM's $6000 386 system with multi-megabyte hard drives. The trend, as I see it, is toward high capability portables for personal computing. The price structure for such portables vary over a great range, and the cost of portables is decreasing. The PC portables lend themselves to desk top use as well. The newer ones have excellent screen display, which really makes dual usage practical.

I was greatly disappointed that Sinclair did not develop a support system for the Z88. They really needed to "drop the other shoe", ie, produce such periphreals as a Monitor interface and a disk drive, plus software support. In fact, it is not possible to even get information support from Sinclair or their North American importer. It appears that the Z88 was not designed to be improved upon.

The Z88's "SAVE to EPROM" is an interesting capability. This may have more future applications than is now present. The idea of "Chip Mass Storage" is before its time. Memory chips are just too expensive to use the Z88's "Eprom Save" concept. So, that side of the Z88's capability is not likely to be used very much. Sir Clive's prejudice against Disk Drives again kills a Sinclair Computer! And, thats how I see the Z88- A computer that is very useful for singular purpose of portability, over priced, under supported, no future, and one that will not induce a significant user group to form. Perhaps Sir Clive's next Computer will set the barn on fire (with a hard drive and a decent display)?

Best wishes to you and the Vancouver group.

Sincerely,

Bill Jones

Bill Jones

Applying the ZX Assembler

by V. Lee

There is a function used in BASIC called "INKEY$", which lets a program read which keys have been pressed on the keyboard. This allows menu driven programs and arcade style games to be possible. This month we are going to assemble our own routine to use in our machine language programs. Parts of the code came from Toni Baker's, "Mastering Machine Code" and from Marcio V.'s article in the May 85 newsletter.

The keyboard is really a series of interconnecting switches. The computer can locate which switch has been pressed by scanning the matrix. If none of the keys are pressed, the scan returns a value of FFFFH. ("H" is used to indicate a hex number.) If a key is pressed, a value representing the location is returned.

The computer can be directed to scan the matrix by CALLing on the ROM routine located at 028BH. The value will be sent to register pair HL. The scan can also be obtained by peeking into the System Variables's "LAST_K" when the computer is operating in the SLOW mode.

As part of its housekeeping chore, the ROM's display routine also performs a keyboard scan. This is how the system knows which keys have been pressed. It then stores this data in the System Variable's LAST_K which we can access simply by "peeking" into its location 4025H, 4026H. Using the register pair BC to perform this task will be an advantage as you will later see.

What are the advantageous and disadvantageous of these two methods? Execution time is much faster using LAST_K than using the ROM routine. However LAST_K can only be used when the computer is operating in the SLOW mode. The system does not generate a display and thereby does not generate a keyboard scan when it operates in the FAST mode.

Now that we have the location code we need to convert it to the key that it represents. This is accomplished by LoaDing register pair BC with the code and then CALLing the ROM routine located at 07BDH. Register pair HL will then point to the character in memory which was pressed.

Let's look at the routine called INKEY. We peek into LAST_K with register BC. Two loops are used to test for a legitimate key press. When a key is pressed, the scan value is less than FFFFH. INCrement it and it will still be "less" than 0000H. The JR NZ instruction continues the first loop until the fingers leave the keyboard. If none of the keys are pressed, the scan values is FFFFH. INCrement it and it becomes 0000H. The JR Z instruction continues the second loop until a key is pressed.

Now we have a genuine key press. The scan value is DECremented to return it back to its original value. Since register pair BC already contains the code, we can continue and CALL on the DECODE routine. We can now LoaD register A with the character that was pressed. A different register can be used but this one works the best.

Let's take a look at the SCRLL routine. It is similar to the SCROLL routine used in BASIC. The TV display is nothing more than a mirror image of the memory's display file. Manipulating this area causes the same effects on the screen. LDIR is a block move instruction with its own "FOR NEXT" loop. The BC number of consecutive bytes are moved from location HL to DE. This shifts all the bytes up by "one line".

The STACK is a "shelf" in memory used for temporary storage. When we left BASIC with the USR statement, a return address was automatically placed there. Thus when we are ready to switch back, we use the instruction RET which retrieves this 16 bit number off of the "shelf" and uses it as a guide.

Other instructions also make use of the STACK. CALLing a subroutine will place a return address, while its counterpart RETurn, remove it for its use. PUSHing a register pair places a copy of its contents while POPing removes the copy from the STACK and place it to a designated register pair.

Only items at the top of the STACK can be acessed. This means that no matter how many items are stored, the last item placed are also the first item taken. And whatever's placed on the STACK must eventually be removed to allow the designated RETurn instruction to acess the address for BASIC.

There are tricks that you can play with the STACK. In "Mastering M/C", it was used as a pointer for printing characters to the screen. The instruction "LD BC,HL" does not exist. But it can be accomplished with two instructions, PUSH HL and then POP BC. You can even change a RET instruction into a "GOTO" instruction by manually changing the value of the return address.

The EXIT routine clears the screen and then returns the system back to BASIC. We accessed this option with the JR instruction which does not place an address on the STACK. And since the STACK is cleared of additonal data, the RETurn instruction finds the address to BASIC.

con't on page 13

Playing with Electricity - Harvey Taylor

- Jan 12/90
- (Updated Feb 23/90)

I have been collecting information on 9600 baud modems for a while now and I finally got around to making up the table below. I have used the manufacturer's data sheets for this info, so take it with a grain of salt. I have seen it said that some products support various protocols, but I simply went by the data sheets.

The modems:

- Data Race Action 32
- Data Race Action 1496
- Data Race Rally 9600
- Data Race VM 1
- Fastcomm FDX 9696
- Hayes Ultra
- Hayes V-series Smartmodem 9600
- Microcom AX/9624c
- Microcom QX/3296c
- Microcom QX/V.32c
- Prometheus ProModem 9600 Plus
- Racal-Vadic 9632PA
- Racal-Vadic 9632VP
- Telcor 3238
- Telcor 2938
- Telcor 3264PC
- Telebit T1000
- Telebit T2500
- Telebit TrailBlazer Plus
- USR Courier HST
- USR Courier HST Dual Standard
- USR Courier HST/ix (for Unix systems)
- USR Courier V.32

Protocols: Transmission / Error & Compression

	Transmission													Error & Compression										
	HST	PEP	HAYES	V.33	V.32	V.29	V.27	V.23	V.22	V.22bis	V.21	Bell212A	Bell103	MNP4	MNP5	MNP6	MMP9	V.42	V.42bis	LAPB	AFT	ARQ	LAPM	Chip Set
DataRace 32					x					x		x	x	x	x									R
DataRace1496				x	x	x				x		x	x											R
DataRace9600						x	x																	R
DataRace VM11						x				x		x	x											R
FastComm9696					x					x		x	x	x	x									R
Hayes Ultra			x		x			x	x	x	x	x	x	x	x			x	x	x			x	?
Hayes 9600			x						x	x		x	x							x	x	x		R
MComAX/9624c						x	x		x	x		x	x	x	x	x		x						R
MComQX/3296c					x				x	x		x	x	x	x			x						?
MComQX/V.32c					x				x	x		x	x	x	x	x	x							?
ProModem					x				x	x		x			x			x						?
RVadic9632VP					x					x		x	x	x	x									R

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RVadic9632PA| | | | |x| | | |x|x| |x|x| |x|x| | | | | | | | |   R
Telcor3264PC| | | | |x| | | | |x| |x|x| |x|x| | |x|x| | | |x| * R
Telcor 2938 | | | | | |x| | | |x| |x|x| |x|x|x| | | | | | | * R
Telcor 3238 | | | | |x| | | | |x| |x|x| |x|x| | | | | | | | * R
T1000       | |x| | | | | | |x|x| |x|x| |x|x| | | | | | | | |   ?
T2500       | |x| | |x| | |x|x|x|x|x|x| |x|x| | | | | | | | |   ?
TBlazer+    | |x| | | | | | |x|x| |x|x| |x|x| | | | | | | | |   C1
USR HST     |x| | | | | | | |x|x|x|x|x|x| |x|x| | |x|x| | | | |   C2
USR V.32    | | | | |x| | | |x|x|x|x|x|x| |x|x| | |x|x| | | | |   C2
USR HST-DS  |x| | | |x| | | |x|x|x|x|x|x| |x|x| | |x|x| | | | |   C2
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ChipSet: R = Rockwell chipset
C1 = TMS32010
C2 = TMS32020

HST - (High Speed asynchronous Transmissions) is a proprietary US Robotics 9600 baud transmission protocol. [9600 and/or 14400 bps, asymmetrical modulation ("back channel" at reduced (300 or 450) bps)]

PEP - (Packetized Ensemble Protocol) is a proprietary Telebit 9600 baud transmission protocol. ("ping-pong")
The TB+ also has "Protocol spoofing" to turn xmodem, kermit, and UUCP G file transfers into streaming protocols.

HAYES - a proprietary "ping-pong" 9600 baud protocol.

LAP-B - Link Access Procedure Balanced

ARQ - Proprietary Hayes Error Correction/Link protocol

AFT - Proprietary Hayes Error Correction/Link protocol

LAP-M - Part of V.42 Link Access Procedure for Modems

* - Telcor has proprietary Error correction (Telcor CRC-16) & data compression.

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Bell 103:  300 bps, full-duplex, FSK encoding
V.21     :  300 bps, full-duplex, FSK encoding
Bell 212: 1200 bps, full-duplex, DPSK encoding
V.22     : 1200 bps, full-duplex, DPSK encoding
V.23     : 1200/75,75/1200 bps, full duplex DPSK encoding
V.22bis  : 2400 bps, full duplex, QAM encoding
V.27     : 4800 bps, half duplex, tribit encoding
V.29     : 9600 bps, half duplex
V.32     : 9600 bps, full-duplex, Trellis encoding with echo cancellation
           4800 bps (V.32 "fallback" speed)
V.33     : 9600, 12000, 14400 bps 4 wire leased line
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FSK  = Frequency Shift Keying
DPSK = Differential Phase-shift Keying
QAM  = Quadrature Amplitude Modeulation
Trellis is a modified QAM
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V.42

A CCITT error correction standard much like MNP4. In fact, because V.42 includes MNP4, all MNP modems establish error-controlled connections with V.42 modems. Error correction technology copes with phone line imparments by automatically restrIn;mitting corrupted data. ALL U>S> Robotics high speed modems (Courier HST and Courier V.32) and the courier 2400e currently incorporate MNP and therefore V.42 compatible.

V.42bis

A CCITT data compression standard similar to MNP5, but providing about 35% better compression - thus better throughtput. To negotiate a standard connection using V.42bis requires V.42. Thus a modem with V.42bis data compression is assumed to include V.42 error correction. All U.S. Robotics high speed modems (Courier HST DUAL STANDARD, Courier HST and Courier V.32) and the Courier 2400e will incorporate V.42bis data compression by early

1990. Data compression increases transmission speed by reducing the number of bits to be sent. The file compressed by the transmitting modem and decompressed by the receiving modem. The sending and receiving systems must both use the same rules of compression and decompression.

X.25 is a DIGITAL packetised transmission standard for PDN's it will support multiple simultaneous sessions on Timenet, Telenet , and AT&T PDN the Hayes can use X.25 instead of V.32 under V.42bis as an option.

X.25 and X.75 modems are called PADS not MODEMS since they are Digital not MODulated.

The term PAD stands for Packet Assembler/Disassembler Trailblazer modems can chat at 19.2 kbps and can achieve an actual throughput of 18,000 baud WITHOUT COMPRESSION. This means that ARC files for example will be transfered at 18,000 baud.

References

FidoNet HST conference
comp.dcom.modems Usenet
BYTE - Mar/83, Page 26; Circuit Cellar by Steve Ciarcia
BYTE - Nov/85, Page 89; Circuit Cellar by Steve Ciarcia
MIPS -Dec/89,Page 44; Fast Talking by William L. Rinko-Gay
BYTE -June/89,Page 162; 4800 Bits, No Errors by S. Apike & S.Diehl
BYTE -June/89,Page 321; Modern Modem Methods by L.Brett Glass
BYTE -Jan/89,Page 281; Whither the Modem? by J.H. Humphrey & G.S.Smock
BYTE -June/88,Page 102; High-Speed Modems by J.H. Humphrey & G.S.Smock
Computer Shopper -Feb/88,Page 9; Speeding along at 9600 Baud by Ted Drude
Computer Shopper -Feb/90,Page 243; LightSpeed 9624E Modem by Ted Drude
EXAR - XR-212AS Modem Design Booklet
Texas Instruments - TMS99532 Data Manual
CCITT Volume VIII.1 Series V Recommendations
Understanding Telephone Electronics by TI Learning Centre (Radio Shack)
The Theory and practice of Modem Design by John Bingham 1988
Wiley Interscience ISBN 0-471-85108-6

>eof

Contributed by VSUG out-of-towner Seward Warner

```
  1 GOTO 10
  3 SAVE "ROMAN NUMBERS"
  5 REM AUGUST 1989
 10 LET P1=1
 20 LET P2=2
 30 LET D$="C,CC,CCC,CD,D,DC,DC
C,DCCC,CM,"
 32 LET D$=D$+"X,XX,XXX,XL,L,LX
,LXX,LXXX,XC,"
 35 LET D$=D$+"I,II,III,IV,V,VI
,VII,VIII,IX,"
 40 DIM H$(9,4)
 42 DIM S$(9,4)
 45 DIM T$(9,4)
 46 PRINT AT 9,0;"============
====================="
 47 PRINT ,,TAB 9;"- STAND BY -
"
 48 PAUSE 200
 49 FAST
 50 FOR I=1 TO 9
 55 GOSUB 500
 60 LET H$(I)=V$
 65 NEXT I
 70 FOR I=1 TO 9
 75 GOSUB 500
 80 LET T$(I)=V$
 85 NEXT I
 90 FOR I=1 TO 9
 95 GOSUB 500
100 LET S$(I)=V$
105 NEXT I
160 CLS
165 SLOW
170 LET R$=""
180 LET N=INT (RND*1999)+1
190 LET NN=N
200 IF N<1000 THEN GOTO 230
210 LET R$="M"
220 LET N=N-1000
230 IF N<100 THEN GOTO 270
240 LET NR=INT (N/100)
242 FOR L=LEN H$(NR) TO 1 STEP
-1
244 IF H$(NR,L)<>CHR$ 0 THEN GO
TO 250
246 NEXT L
250 LET R$=R$+H$(NR, TO L)
260 LET N=N-NR*100
270 IF N<10 THEN GOTO 310
280 LET NR=INT (N/10)
282 FOR L=LEN T$(NR) TO 1 STEP
-1
284 IF T$(NR,L)<>CHR$ 0 THEN GO
TO 290
286 NEXT L
290 LET R$=R$+T$(NR, TO L)
300 LET N=N-NR*10
310 IF N=0 THEN GOTO 330
320 LET R$=R$+S$(N)
330 PRINT AT 4,0;"GIVEN THE ROM
AN NUMERAL"
340 PRINT ,,R$
350 PRINT ,,,,"WHAT IS THE CORR
ESPONDING"
360 PRINT ,,"NUMBER?"
370 INPUT ANS
380 PRINT
390 IF ANS=NN THEN GOTO 430
400 PRINT ,,"THE NUMBER IS ";NN
405 PRINT ,,"TOUCH <ENTER>"
410 INPUT E$
420 GOTO 160
430 CLS
435 PRINT AT 10,12;"CORRECT"
440 PRINT
450 PRINT TAB 8;"ANOTHER PROBLE
M?"
460 PRINT ,,,,TAB 5;"(TOUCH  Y/
N)"
470 LET E$=INKEY$
475 IF E$="" THEN GOTO 470
480 IF E$="Y" THEN GOTO 160
490 GOTO 600
500 IF D$(P2)=CHR$ 26 THEN GOTO
530
510 LET P2=P2+1
520 GOTO 500
530 LET V$=D$(P1 TO P2-1)
540 LET P2=P2+1
550 LET P1=P2
560 RETURN
600 CLS
610 PRINT AT 10,14;"BYE";AT 21,
0;"END PROGRAM"
620 GOTO 620
```

****

...this should gladden the hearts of all those held hostage by the Cable Pirates!!

INVESTMENT PLANS FOR SKY CABLE:

NBC Television and Rupert Murdoch's News Corporation and two other major communications companies announced plans to invest $1 billion for the 1993 launch of Sky Cable, the first high power Direct Broadcast Satellite service to span the United States, says the Financial Times.

SKY CABLE MAY REPLACE CABLE:

Sky Cable, a TV service announced Wednesday, plans to sell CNN, ESPN and other networks directly to viewers. Customers will receive the signals on a tiny dish placed on a roof or windowsill. Sky Cable plans to launch the world's most powerful satellite in 1993 and beam up to 108 channels back to the USA. Cost: about $300.

Let's take a look at the whole program which prints unexpanded characters from the keyboard to the screen. As usual we begin by defining some variables to make the listing easier to follow. The numbers with the "+" in front tells the Assembler that they are decimals and that they are to be converted into hex. Next we calculate the address for the various locations on the screen and then set up register HL as a pointer for line 21 and register B as a counter for the number of characters allowed per line. We also provide an area for saving the calculations as the registers will be altered in the program.

We CALL INKEY to find which keys have been pressed. Certain keys have been given command functions and will be tested. The ComPare instructions are used along with conditional branch instructions to form "IF THEN" statements like those used in BASIC. ComPare tests by subtracting. The value in the specified source is always "compared" with the value in register A. The status are then placed in the FLAG register.

In this program we utilize both the ZERO flag and the CARRY flag. If the value in register A is equal to the source value, the ZERO flag will be "zero". If the value in register A is not equal to the source value, the ZERO flag will be "not zero". If the value in register A is less than the source value, the CARRY flag will show a "carry". If the value in register A is equal to or greater than the source value, the CARRY flag will show "no carry". Conditinal branch instructions such as JR cc, JP cc, CALL cc or RET cc can then be used to act accordinly.

If you pressed <SHIFT> <A> for STOP, the program will go to the EXIT routine. If you press <ENTER>, the program will go to the NLINE routine. And finally, if you press any key whose character code is greater than "Z", the CP RAND and JR NC instructions forms a trap to prevent it from being printed and causing the system to crash. The "LD (HL),A" print routine is not set up to handle expanded characters.

We now use our pointer and counter to print our character and then make a decision, "Is the line full"? If it's not full, the program will save the pointer and counter and then wait for the next key press. If it is full, the screen will scroll up one line, the pointer and counter will be reset and then the program will wait for the next key press.

Up till now we've only covered programming parts of the computer, the screen and now the keyboard. What's next you ask? How about some real programming with real applications? How about programming I/O devices and developing programs from flow charts? And examine memory and I/O interfacing from a binary point of veiw. In short, how about pushing the ZX/TS to its limits?

```
        ;------------------------;
        ;                        ;
        ;    KEYBOARD TEST       ;
        ;------------------------;
        ;                        ;
        ;  THIS PROGRAM PRINTS   ;
        ;UNEXPANDED CHARACTERS   ;
        ;FROM THE KEYBOARD TO    ;
        ;THE SCREEN.             ;
        ;                        ;
        ;PRESS                   ;
        ;   <SHIFT><A> TO EXIT.  ;
        ;------------------------;

DCODE=07BD;ROM
CLS=  0A2A; ROUTINES.
SLOW= 0F2B;
DFILE=400C;SYSTEM
LASK= 4025; VARIABLES.
RND=  40  ;CHARACTER
ENTER=76  ; HEX
STOP= E3  ; CODE.
ROW=  +32 ;ROW HAS 32 COLUMNS.
LIN1= +33 ;1 ROW *33COLS.
LIN20=+660;20ROWS*33COLS.
SIZE= +726;22ROWS*33COLS.


INITL LD HL,(DFILE);SAVE START
      INC HL       ; ADDRESS OF
      LD (SCRN),HL ; "SCREEN".
      LD DE,LIN1   ;SAVE ADDR
      ADD HL,DE    ; OF THE
      LD (ATL1),HL ; 1ST LINE.
      LD DE,LIN20  ;SAVE ADDR
      ADD HL,DE    ; OF THE
      LD (ATL21),HL; 21ST LINE,
      CALL SLOW    ;SET SLOW M.

STPOS LD HL,(ATL21);SET PRINT
      LD B,ROW    ;POSITION.

SVPOS LD (LIN21),HL;SAVE
      LD HL,RCOUN  ; PRINT
      LD (HL),B    ; POSITION.

PRINT CALL INKEY   ;GET KEY.

      CP STOP      ;DO YOU WANT
      JR Z EXIT    ; TO QUIT?

      CP ENTER     ;IS IT A
      JR Z NLINE   ; NEWLINE?

      CP RND       ;IS IT A
      JR NC PRINT  ; LEGL CHAR?

      LD HL,RCOUN  ;GET
      LD B,(HL)    ; PRINT
      LD HL,(LIN21); POSITION.

      LD (HL),A    ;PRINT
      INC HL       ; CHARACTER.
```

```
;-----------------------;
;        INKEY          ;
;-----------------------;
;  THIS ROUTINE IS USED ;
;TO FIND WHICH KEYS ARE ;
;PRESSED ON THE KEYBOARD;
;                       ;
;USE ONLY IN SLOW MODE.  ;
;REGS AF, BC, DE AND HL  ;
;        ARE AFFECTED.  ;
;REG A CONTAINS THE KEY  ;
;     PRESSED IN HEX.   ;
;-----------------------;

INKEY LD BC,(LASK);WAIT FOR
      INC C       ; FINGERS TO
      JR NZ INKEY ; LEAVE KB.
WAIT  LD BC,(LASK);WAIT
      INC C       ; FOR FINGERS
      JR Z WAIT   ; TO PRESS A
      DEC C       ; KEY.
      CALL DCODE  ;PLACE KEY
      LD A,(HL)   ; IN REG A.
      RET


;-----------------------;
;        SCRLL          ;
;-----------------------;
;  THIS ROUTINE WILL    ;
;SCROLL UP THE FIRST 22  ;
;LINES ON THE SCREEN     ;
;                       ;
;LINE 23 MUST BE BLANK.  ;
;REGS BC, DE, AND HL     ;
;        ARE AFFECTED.  ;
;-----------------------;

SCRLL LD HL,(ATL1);SCROLL
      LD DE,(SCRN); SCREEN
      LD BC,SIZE  ; UP ONE
      LDIR        ; LINE.
      RET


;-----------------------;
;         EXIT          ;
;-----------------------;
;  THIS ROUTINE WILL END;
;THE PROGRAM AND RETURN  ;
;BACK TO BASIC.          ;
;                       ;
;SCREEN IS CLEARED.      ;
;ALL REGS. ARE AFFECTED. ;
;                       ;
;CAUTION- STACK MUST BE  ;
;         CLEAN.        ;
;                       ;
;EVOKE WITH JR/JP EXIT.  ;
;-----------------------;

EXIT  CALL CLS     ;CLR SCREEN.
      RET          ;EXIT TO
                   ; BASIC.


SCRN  0000
ATL1  0000
ATL21 0000
LIN21 0000
RCOUN 00

;--------- END ---------;
```

Ken Abramson sent in by way of the Froghollow BBS these interesting news items he picked up. Maybe we can persuade Ken to develop this into a monthly column.

Mesg: 310	Date: 13-Feb-90
Fldr: General	Time: 22:06:35
Subj: NEWS	Rply: None (BOT-EOT)
From: Ken Abramson	To: Rod Humphreys

Source: USA TODAY/Gannett National Information Network

AT&T REPORTS FIRST FABRICATION:

Researchers at AT&T Bell Laboratories have reported the first fabrication and data transmission using two new types of photonic integrated circuits. The new devices are semiconductor chips that use integrated optical waveguides to pipe light from one optical device to the next.

AT&T CREATES NEW CHIP:

The balanced heterodyne receiver PIC can replace all the discrete optical devices needed for coherent reception techniques with a single semiconductor chip. Only several millimeters in size, it is capable of receiving light signals using the same principles as conventional FM radio receivers. Its tuning range is 35,000 times larger.

AT&T DEVELOPS NEW PIC:

AT&Ts new PIC is a single-chip transmission source for use in optical fiber systems employing wavelength division multiplexing. This is a technique where a number of independent conventionally encoded optical signals of different colors can be combined onto the same optical fiber separated at the receiver using optical filters.

TRIDENT MISSILES ARE LAUNCHED:

Two Trident 2 missiles were successfully launched 20 seconds apart on Monday, ending the U.S. Navy's three-year test of the weapons. The two 44-foot missiles were launched from the nuclear submarine Tennessee 200 miles off the Florida coast. The Trident 2 costs $26.5 million apiece; the U.S. Navy says it is more accurate than the earlier Polaris, Poseidon and Trident 1.

MARIETTA HAS LANTIRN DEAL:

Martin Marietta of Bethesda, Md. U.S.A., has a $194.4 million U.S. Air Force contract for 120 electro-optic targeting pods for the LANTIRN system. The targeting pods, mounted on F-15E and F-16 fighters, are advanced technology fire control systems used with navigational systems to allow 500 mph, low-altitude flight in total darkness.

FUN PRODUCTS PHONES GET SNAZZY:

Fun Products of Berkeley, Calif. U.S.A., has unveiled a new, snazzier line of telephones that feature sound effects, talking chips and new finishes. The firm last year introduced the trimline and desktop phones encased in clear Lexan plastics, with multi-colored internal parts and flashing neon lights. New feature: FunFX system, pre-programmed sound effects such as a laugh, scream or applause.

COMET MAY GIVE LIGHT SHOW:

Astronomers may get a real treat if the space shuttle delivers the giant Hubble Space Telescope into orbit in time for comet Austin, which will be six times brighter than Haley's comet. Its predicted trajectory brings it dramatically close to the sun and Earth, making it visible in April. The long-delayed telescope launch is scheduled for April aboard a shuttle.

IBM CREATES MEGA CHIP:

IBM Corp. has produced a computer memory chip capable of storing up to 16 million bits of information, four times the storage capacity of the most powerful chips on the market. The 16-megabit chip can store the equivalent of 1,600 pages of text on a surface smaller than a postage stamp. (From the USA TODAY Money section.)

SALAD BAR PROVIDES POWER:

With manure and salad bar scraps, researchers at the University of Maine are using the natural process of anaerobic digestion to generate electricity. In a "digester" tank, bacteria break down the organic matter and create a gas that is burned to spin a generator. It produces $8,000 worth of electricity a year.

AIRCRAFT TO SEARCH OZONE HOLE:

A pilotless, remote control airplane will fly over the ozone hole over Antarctica next year to help scientists gather information they otherwise could not obtain. Full of instruments, the plane will fly as high as 85,000 feet. Currently, manned flights can not go higher than 68,000 feet or remain in the ozone hole for more than a few days.

SPACE-AGE SYSTEM TRACKS FIRES:

The U.S. Forest Service and NASA are devising the Firefly system to spot and track forest fires. Electronic gear aboard the aircraft will use new Global Positioning System navigation satellites. The image and the plane's location will be processed together in a computer on the aircraft and which will then be transmitted to the Forest Service's field computers.

SATELLITE SERVES AIR AND GROUND:

IDB Aeronautical Communications, a subsidiary of IDB Communications Group Inc., will join Teleglobe Canada Inc., a subsidiary of Teleglobe International Inc., in providing satellite aeronautical communication services. The service uses the INMARSAT satellite system. Signals will be sent, received via satellite from terminals on the aircraft to and from six earth stations worldwide.

COLON CANCER STRIDES HOPEFUL:

Recent strides in prevention, diagnosis and treatment of colon cancer - the second-most lethal form after lung cancer - will likely cut its death rate, which has barely budged since 1970. Some 110,000 new U.S. cases are diagnosed annually; 60,000 die in the U.S. yearly. U.S. scientists say surgery and the chemotherapy drugs fluorouracil and levamisole cut deaths by a third among late-stage patients.

APNEA AFFECTS MEN, BULLDOGS:

One in five middle-aged men suffer the potentially fatal sleep disorder called apnea, which stops breathing for a few seconds during sleep. University of Pennsylvania scientists say

bulldogs also have the disorder because like humans, they snore and stop breathing often while asleep. The team hopes studying the dogs will reveal ways to treat both men and beasts.

FIRM, NIH TACKLE BRAIN DRUG:

CORTEX Pharmaceuticals of Irvine, Calif. and the U.S. National Institutes of Health will join in a brain protection research project. NIH chemisanalogs of the brain chemical adenosine, for development by CORTEX as drugs to limit the brain damage and memory loss associated with stroke.

WAVE OF PCs TO HIT MARKET

Beginning Thursday, a wave of PCs will hit the market that do away with computer codes, even keyboards. The electronic notepads or pen-based PCs recognize the printed word written on a computer screen and translate it to text. Experts say they will be ideal for those who shy away from PCs because of complexity or knowledge of typing. Price: $1,995-$6,000. (From the USA TODAY Money section.)

MICROCHIP IDENTIFYING PETS:

A microchip is replacing dog and cat ID tags. An ID number is encoded in the chip, which is the size of a grain of rice. The chip then is inserted under the pet's skin, between the shoulder blades at the base of the neck. Animal shelters and other agencies that care for stray pets then use a scanner to read the chip and determine the owner. (From the USA TODAY Life section.)

APPLE CUTS EMPLOYEES:

Citing slowing sales of personal computers, Apple Computer said it will lay off three percent of its work force, 400 workers, in two months. The news is no surprise: Apple said Jan. 15 that it planned an undetermined number of layoffs and other cost-cutting moves. Apple has been criticized for neglecting its traditional customers by not updating its low-priced Macintosh PC.

...con't from last issue.

```
 700 PRINT #0;AT 0,0,,,,: INPUT
"Enter New Domain: +/-";d
 710 LET xscale=d/127: GO TO 415
 727 REM
 728 REM Enter New Lstart
 729 REM
 730 PRINT #0;AT 0,0,,,,: INPUT
AT 0,0;"Enter New Lstart (-127 t
o 127): ";lstart
 735 IF ABS lstart>127 THEN GO T
O 730
 740 GO TO 415
 747 REM
 748 REM Enter New Range
 749 REM
 750 PRINT #0;AT 0,0,,,,: INPUT
"Enter New Range: +/-";d
 755 LET yscale=d/87: GO TO 415
 797 REM
 798 REM Enter New Step
 799 REM
 800 PRINT #0;AT 0,0,,,,: INPUT
"Enter New Step: ";z: GO TO 415
 847 REM
 848 REM Enter New Function
 849 REM
 850 PRINT #0;AT 0,0,,,,: INPUT
AT 0,0;"f(x)="; LINE a$: GO TO 4
15
 867 REM
 868 REM Values
 869 REM
 870 PRINT #0;AT 0,0,,"COORDS OF
 POINT. Use 56780 CAPS"
 872 LET x=0: LET y=0
 875 PLOT OVER 1;x+127,y+87: PAU
SE 2: PRINT #0;AT 0,0;"(x,y)=(";
FN r(x*xscale);" ";FN r(y*yscale
);")      ",: PLOT OVER 1;x+127,y+
87
 880 LET g$=INKEY$: GO TO 875-45
0*(g$="0")+10*(g$>="5" AND g$<="
8")+25*(g$>=CHR$ 8 AND g$<=CHR$
11)
 885 LET x=x-(g$="5")+(g$="8"):
LET y=y-(g$="6")+(g$="7")
 890 IF ABS x>127 THEN LET x=-SG
N x*127
 892 IF ABS y>87 THEN LET y=-SGN
 y*87
 895 GO TO 875
 900 LET x=x-8*(g$=CHR$ 8)+8*(g$
=CHR$ 9): LET y=y-8*(g$=CHR$ 10)
+8*(g$=CHR$ 11): GO TO 890
 947 REM
 948 REM Clear Graph
 949 REM
 950 GO SUB 500: GO TO 425
 967 REM
 968 REM Graph Function
 969 REM
 970 GO SUB 100: GO TO 425
 997 REM
 998 REM Instructions
 999 REM
1000 CLS : PRINT TAB 8;"CURVE SK
ETCHING";'TAB 4;"December 1989
Albrecht";'
1005 PRINT "  This program sketc
```

```
has any      function entered by
the user     on a scaled cartesia
n coordinateplane.",
1010 PRINT '"  To sketch a curve
, first      choose the option f
or changing  the function from t
he menu. Thenenter the function
as a functionof x. EG to enter t
he function  f(x)=x^2-50, enter
x*x-50."
1015 PRINT '"NOTE: enter all pow
ers of x as          x's multiplie
d by them-           elves as in x
^3=x*x*x.            The IS2068 wi
ll not other-        wise raise ne
gative num-          bers to any p
ower."
1017 GO SUB 460
1020 CLS : PRINT "  You can ente
r any function    using the math
 operations avail-able from IS20
68 basic.",,
1025 PRINT "  Next set up your c
oordinate    scale. This is done
by choosing the change domain an
d range      options from the men
u. The com-  puter will ask for a
 domain      (range) for the valu
es of x (y) to float over. EG-ch
oosing a     domain of +/-50 wil
l set the     left extreme of the
 x-axis,as    -50 and the right a
t 50.",,
1030 PRINT "  The final paramete
r that can   be manipulated is th
e step. The step is how many pix
els skipped horizontally before
a pixel is   plotted on the graph
. EG- If thestep is 1, then a po
int on the   graph is calculated
and plotted."
1035 GO SUB 460
1040 CLS : PRINT "at every pixel
 on the screen. Ifthe step is 10
 then a point is  plotted every
ten pixels on the screen.  The I
S2068 will fill inany gaps in th
e graph.",,
1045 PRINT "  The smaller the st
ep the more accurate the graph i
s. The lar-  ger the  step the le
ss accurate the graph is. What i
s the pur-   pose of the step? Fo
r complic-   ated functions the g
raphing may take a long time, so
 by choosinga large step, the g
rphing will  be done quicker (at
 the expense of accuracy as note
d above).",,
1047 PRINT "  Lstart determines
where the    computer will begin
calculating the graph. It ranges
 in value    from -127 (left edge
 of screen)  to 127 (right edge o
f screen).   This may be useful i
n speeding   up the graphing of f
unctions     restricted to posit
ive numbers. (EG- f(x)=LN x) To
graph only   +ve numbers, set ls
tart-0."
1050 GO SUB 460
1055 CLS : PRINT "  A neat featu
re of this func-  tion grapher i
s that after everygraphing, the
program does not  clear the scre
en. This makes it possible to su
perimpose several graphs of diff
erent functions bychanging the f
unction via the   menu. You can
 also superimpose  graphs of fun
ctions on differentscales - alth
ough there may not be any point
in that.",,
1060 PRINT "  OPTIONS FROM THE M
ENU:",,"See Parameters: See curr
ent          Domain, Range, Step, F
unction Clear Screen: Clears the
 Graph       Graph Function
             Coords: Move a point aro
und on       the graph and the comp
uter         will give the coordin
ates": GO SUB 460
1065 CLS : PRINT "  *** AUGMENTE
D NOTE:",,"  If the program enco
unters any   errors in calculati
on-eg x/0    then the program wi
ll beep and  continue plotting."
,,"   You may press break at any
   time followed by the press of
 a key to abort graphing."
1067 PRINT ,,"  PRESS A KEY FOR
PROGRAM"
1070 GO SUB 460: RETURN
```

```
1     :  95   :  7014
2     :  21   :  1380
3     :  39   :  3691
5     :  19   :  2582
10    :  70   :  7225
15    :  22   :  2571
20    :  17   :  1810
98    :   2   :   481
99    :  12   :  1914
100   :   2   :   481
101   :  12   :  1258
102   :  86   :  6931
105   :  32   :  4588
106   :  22   :  2886
107   :  12   :  1882
110   :  47   :  3411
112   :   7   :  1157
115   :  33   :  3813
119   :   2   :   481
120   :  16   :  2300
121   :   2   :   481
125   :  53   :  8752
130   :  11   :   915
149   :   2   :   481
150   :  12   :  1820
151   :   2   :   481
155   :  41   :  6419
157   :  65   :  8802
160   :  100  :  13997
179   :   2   :   481
180   :  10   :  1756
```

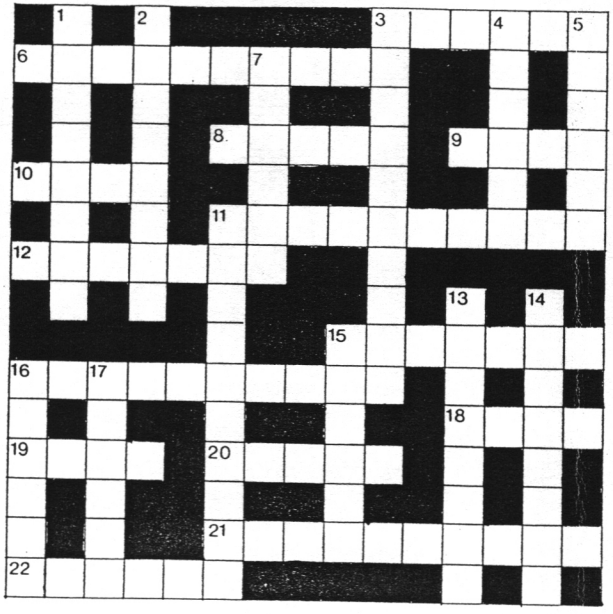
181	2	481	605	136	11540	875	151	11789
185	21	3732	610	36	3418	880	97	8055
190	5	769	612	177	15839	885	46	4443
249	2	481	615	36	3438	890	31	3454
250	113	13390	620	46	3236	892	29	3095
251	2	481	625	36	3459	895	11	858
255	108	9965	630	11	868	900	111	7051
257	34	3122	697	2	481	947	2	481
260	58	5440	698	18	2647	948	13	1974
265	43	3598	699	2	481	949	2	481
270	23	2780	700	58	4774	950	22	1923
399	2	481	710	31	3217	967	2	481
400	6	1104	727	2	481	968	16	2538
401	2	481	728	18	2691	969	2	481
405	74	5653	729	2	481	970	22	1773
410	64	4311	730	95	7457	997	2	481
415	70	7750	735	30	3540	998	14	2467
417	140	8756	740	11	890	999	2	481
425	70	7170	747	2	481	1000	72	6798
427	103	6561	748	17	2435	1005	107	14460
449	2	481	749	2	481	1010	191	24668
450	14	2263	750	57	4554	1015	189	21282
451	2	481	755	30	2983	1017	11	942
455	30	1579	797	2	481	1020	95	12998
460	17	2313	798	16	2369	1025	318	40213
465	24	3298	799	2	481	1030	228	31126
470	2	521	800	64	5205	1035	11	942
499	2	481	847	2	481	1040	158	21459
500	39	4282	848	20	2998	1045	322	43627
501	2	481	849	2	481	1047	318	41556
505	77	4997	850	72	4820	1050	11	942
510	126	12154	867	2	481	1055	349	48985
515	2	521	868	8	1434	1060	262	31625
598	2	481	869	2	481	1065	237	30790
599	17	2738	870	66	4717	1067	31	3318
600	2	481	872	22	1583	1070	13	1312

****

SINCLAIR USER *January 1986*

ZXWORD

by Henry Howarth



Across

3. Visit Alicante to discover this type face (6)
6. Unit I'm also designing for a game style (10)
8. Comparatively higher (5)
9. Largish computer on board small car? (4)
10. Alexander's surname may have a familiar ring to it (4)
11. Report disc corruption giving information on data record (10)
12. Bob Geldof's program of famine relief? (4,3)
15. Asteroids in remote southern setting (7)
16. Supported by material of an explanatory nature (10)
18. In theory, they could be disjunct, null or universal (4)
19. Signal fluctuation gives the deaf a problem (4)
20. CHR$69+CHR$78 attempt access (5)
21. Dedicated number cruncher (10)
22. Angular academic achievement (6)

Down

1. Alternative logical operation causes a riot here (6-2)
2. Multi-User Dungeon accommodation found at low tide (8)
3. Performed calculus operation on this type of circuit (10)
4. Spectrum command to send output to the printer (6)
5. Facsimile machine (6)
7. Bad bet badly positioned on the screen (6)
11. Not the same as the sum? — the opposite, in fact (10)
13. Someone and everyone — like IBM's micro (9)
14. Hand shaking? — pot color! (8)
15. REM, C, IT standardised internationally? (6)
16. Definitive start to finish rear-guard action (6)
17. Programming could be a dog in C! (6)

solution on back cover

S.M.U.G. Presents

The 1990 SINCLAIR COMPUTER Exposition

MILWAUKEE WISCONSIN

June 2 & 3 /Banquet Friday Night June 1

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Both days	: $ 7.00	$ 9.00	
Banquet	: $16.00	$16.00	Limited seating
Table	: $25.00 (incld. 2 day badge)	$25.00	Limited table space

Tables are 6 feet by 30 inches

For **MORE INFORMATION** contact

Bill Heberlein
5052 N. 91st Street
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or

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Please reserve _____ Banquet tickets @ $16.00 each = $_____

Please reserve _____ 6' x 30" tables @ $25.00 each = $_____

I have included a check/money order for total = $_____

ZX Word solution

Across

3. Italic
6. Simulation
8. Above
9. Mini
10. Bell
11. Descriptor
12. Soft Aid
15. Meteors
16. Documented
18. Sets
19. Fade
20. Entry
21. Calculator
22. Degree

Down

1. Either-or
2. Mudflats
3. Integrated
4. LPRINT
5. Copier
7. Tabbed
11. Difference
13. Personal
14. Protocol
15. Metric
16. Defend
17. Coding

VSUG

The Vancouver Sinclair Users Group has been in existence since 1982. We are a support group for the owners and users of all SINCLAIR and TIMEX computers.

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